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Figs. 25-31. *Phyllachora junci* (Fr.) Fuckel on *Juncus effusa*.

25. Host showing the stroma.
26. Cross section of stem of host showing perithecia.
27. Ascus showing ascospores before the last division in the spores.
28. Ascospores in process of dividing.
29. Ascospores after final division.
30. Ascus with sixteen ascospores.
31. Paraphysis.

BLACKSPOT CANKER AND BLACKSPOT APPLE ROT.

W. H. LAWRENCE.

Macrophoma curvispora Peck; Torrey Bot. Club, Vol. 27, 21 Ja. 1900. *Gloeosporium malicorticis* Cordley; Bot. Gaz. Vol. 30, No. 1, p. 57, Jl. 1900. *Myxosporium curvisporum* (Peck) Sacc. in litt.

Blackspot Canker¹ fungus like bitter rot fungus causes a disease of both the tree and fruit. It differs from bitter rot, however, in that the canker stage does by far the greater amount of damage. This stage during the past few years has become very prevalent in the Maple Ridge and Mission districts of British Columbia and in Western Oregon and Western Washington in localities where the rainfall is considerable during the latter part of autumn and early winter.

In January, 1903, numerous decaying apples were found among stored fruit. A few pustules were present in some of the decaying areas. Later the epidermis overlying each pustule splits open exposing a central mass of creamy white spores. These spores were typical of the Blackspot Canker fungus except they were a little larger. Inoculations were made to determine the relation of the canker and rot. The fungus grown from decaying apples was placed in apple twigs with positive results. Spores taken from pustules in cankers placed on uninjured epidermis of the fruit also gave positive results in most cases.

The first indication of the presence of the fungus is a slight discoloration of the flesh of the apple just beneath the epidermis. The flesh becomes a light brown color and this is marked enough to be seen by the naked eye. As more flesh becomes involved the color becomes deeper brown. The epidermis makes a corresponding change in color. Decaying spots become depressed, dry and leathery. Pustules soon begin to make their appearance at the point of infection. The pustules are usually arranged in concentric circles about the point of infection—the more rapidly the

¹ Blackspot or Apple Canker; C. V. Piper, Ranch & Range, 8 Mr. 1900. Apple tree Anthracnos; A. B. Cordley, Bull. 60 Oregon Agr. Exp. Sta. Ja. 1900 and Bot. Gaz. Vol. 30, No. 1, p. 57, Jl. 1900. Blackspot Canker; W. H. Lawrence, Bull. 66 Wash. Agr. Exp. Sta. 1904.

rot develops the more regular are the rings of pustules. In many cases the decaying areas are found near the basin and cup ends of the apple along with apple scab fungus, in codling moth burrows, and in bruised places but over 50 per cent. of the cases observed show that the fungus enters directly through the epidermis of the fruit.

Moisture and temperature exert a marked influence on the development of the rot. In cool, dry weather the spots increase in size, but few pustules are developed. During cool, damp weather an abundance of pustules were found. There is also a tendency for varieties of fruit to decay more rapidly than others.

Examination of the fungus in numerous collections of infested bark gave forms that did not fully agree with the descriptions by Cordley and Peck. The description of the fungus as observed in these investigations is as follows:

Parasitic in the bark and sapwood of the trunk and the branches and on the stored fruit of the cultivated apple.

In the Bark. — Infested areas depressed, dark brown to blackish, oblong in outline one-fourth to six inches in length or longer; sometimes merging together when fully grown, free from the sapwood and bounded by a ragged fissure; acervuli (pustules) abundant, irregularly but quite equally distributed; round to oblong 200-900 mmm. in length, averaging 400-700 mmm., rupturing the epidermis, exposing a creamy white mass, later becoming black; pycnidia absent; stroma usually flattened rarely concave, bearing numerous simple or branched, septate conidiospores as long as, or longer than the conidia; conidia borne acropetally, non-septate, hyaline or rarely with a greenish tint, oblong, geniculate or usually curved 3.8-5 mmm. x 15-20 mmm.

On the Fruit. — Decaying spots light to dark brown, concave, dry and leathery; acervuli numerous, usually larger than those in bark, usually concentrically arranged; stroma as described above; conidiospores longer, usually much branched, conidia varying much in size and shape, as long as 30 mmm.

GOMPHIDIUS RHODOXANTHUS ONCE MORE.

D. R. SUMSTINE.

Agaricus rhodoxanthus Schweinitz, Syn. Car. p. 83. 1822.

Gomphus rhodoxanthus Schweinitz, Syn. N. A. F. p. 151. 1834.

Paxillus flavidus Berk. Decades N. A. F. 116.

Flammula rhodoxanthus Lloyd. Mycolog. Notes. Herbst, Fung. Flora Lehigh Valley.

Schweinitz changed the name from *A. rhodoxanthus* to *Gomphus rhodoxanthus* in his Synopsis in 1834. Fries in his